UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

April 3, 2007

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Idaho National Laboratory – Subsurface Disposal Area Superfund Site

FROM: David E. Cooper, Chair
National Remedy Review Board

TO: Daniel Opalski, Director
Office of Environmental Cleanup
U.S. EPA Region X

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Operable Unit 7-13/14 (Subsurface Disposal Area) of the Idaho National Laboratory, Superfund Site in Butte County, Idaho. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator announced the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board evaluates the proposed actions for consistency with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and relevant Superfund policy and guidance. It focuses on the nature and complexity of the site; health and environmental risks; the range of alternatives that address site risks; the quality and reasonableness of the cost estimates

for alternatives; regional, state/tribal, and other stakeholder opinions on the proposed actions, and any other relevant factors.

Generally, the Board makes advisory recommendations to the appropriate regional decision maker. The Region will then include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the Region is expected to give the board's recommendations substantial weight, other important factors, such as subsequent public comment or technical analyses of response options, may influence the Region's final decision. The Board expects the Regional decision maker to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. It is important to remember that the Board does not change the Agency's current delegations or alter in any way the public's role in site decisions.

Overview of the Proposed Action

The Idaho National Laboratory (U.S. Department of Energy) is located in southeastern Idaho and occupies 890 square miles. This operable unit, the Subsurface Disposal Area (SDA), is located in the Radioactive Waste Management Complex. SDA encompasses 97 acres; and waste is buried in approximately 35 of those acres. It includes widespread contamination by volatile organic compounds, primarily carbon tetrachloride (CCL_4) in the vadose zone and aquifer, and numerous pits, trenches, and vaults where radioactive waste (including transuranic (TRU) contaminated waste) and organic wastes were stored, as well as a large pad (Pad A) where waste was placed above grade and covered.

The preferred alternative presented to the Board at the meeting was not included in the package that the Board reviewed before the meeting, although all the components were presented in the package. Generally, the recommended alternative includes:

1) Removal of approximately 4 acres of TRU and organic wastes;
2) Grouting of approximately 0.2 acres of waste containing mobile radionuclides;
3) Compaction of waste areas including Pad A;
4) Vapor extraction for organic contaminants in the vadose zone (OCVZ);
5) Capping of waste with an evapo-transpiration cap covering approximately 105 acres;
6) Institutional controls to manage potential human exposure to waste left in place; and
7) Monitoring, including monitoring of institutional controls.

The total estimated cost of the preferred remedy is approximately $750M.

NRRB Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with Dennis Faulk and Nicholas Ceto of your staff and Daryl Koch, Idaho Department of Environmental Quality on February 21, 2007. Based on this review and discussion, the Board offers the following comments:

1. The preferred remedy as presented to the Board at the meeting involves a combination of actions to address both radiological and chemical contamination (primarily carbon tetrachloride).

The Board agrees with actions to remove organics that are a source of ground water contamination and which may thereby improve the effectiveness of the ongoing soil vapor extraction process and potentially shorten its necessary lifespan. The Board recognizes that the chemical and radiological contamination are commingled and that removal of the chemical wastes would result in removal of the radiological or TRU wastes which are subject to certain regulatory disposal requirements (i.e., disposal at the Waste Isolation Pilot Project (WIPP)). Finally, the Board notes that DOE and the State of Idaho signed a 1995 settlement agreement that addresses TRU wastes at the site, which may influence where and how DOE will manage TRU waste.

2. The materials presented to the Board did not identify any of the wastes in the SDA as principal threat wastes although it appeared that some of them may meet the definition of principal threat waste. At a minimum, the waste contaminated with high concentrations of organic chemicals and the higher concentrations of radiological or TRU waste appears to be principal threat wastes. The organic waste may be principal threat waste due to its toxicity, mobility, and impact on area ground water. TRU waste may be principal threat waste due toxicity and high risks from direct contact. The decision documents should identify principal threat wastes and indicate whether the remedial alternatives meet the preference for treatment. For principal threat waste that would not be treated in the preferred alternative (e.g., waste being disposed of at WIPP), the decision documents should explain why treatment is not preferred. The Board recognizes that the WIPP is a unique containment facility.

3. Several of the remedial alternatives would include excavation, sorting, and off-site disposal of waste. However, the package was not clear about what criteria would be used to identify material to be excavated and disposed off-site at the WIPP. From the discussion at the meeting, it is the Board's understanding that proposed criteria would include visual evidence of radiological or TRU contaminated wastes (e.g., filters, sludges, roaster oxides) and field screening for volatile organic contaminants through use of a photo ionization detector (PID). The Board recommends that field screening PID levels in soil and waste be correlated with waste concentrations in soil that can cause potential ground water contamination. This information can be used to develop numeric criteria for excavation of organics, and these criteria should be included in decision documents for the site.

4. Based on the information in the package and presented to the Board, some alternatives evaluated by the Region were not adequately described in a way that made it possible to evaluate them based on the NCP's nine criteria and compare to other alternatives. For example, the preferred alternative presented at the meeting was not in the package as a separate alternative; and therefore, it was difficult to determine any differences in cost-effectiveness between alternatives. Additionally, it appears to the Board that an alternative that includes capping, in-situ grouting and continued operation of the OCVZ system could satisfy the remedial action objectives and it was unclear whether such an alternative was evaluated. The Board recommends that such an alternative be evaluated and that decision documents describe all alternatives in a way that facilitates a clear nine-criteria and comparative analysis.

5. The Board notes that several aspects of the package appear to adopt an approach that may be different from the NCP and Agency guidance, which indicate a point of departure of 10^{-6}

cancer risk. EPA has developed a Radionuclide Preliminary Remediation Goals for Superfund on–line calculator to support this 10^{-6} cancer risk point of departure. In addition, from the package it appears the cleanup levels for this remedy were based on a 15 mrem/yr dose from DOE guidance, with no Federal or State applicable or relevant and appropriate requirements (ARAR) as the source of this dose limit, rather than the risk-based level expected for CERCLA remedies. This practice is inconsistent with OSWER directives, including Establishment of Cleanup Levels for CERCLA sites with Radioactive Contamination, (OSWER Directive 9200.4-18, August 1997) and Radiation Risk Assessment at CERCLA Sites Directive 9200.4-31P, December 1999). The Board recommends that the decision documents clearly explain how the approach proposed for this site is consistent with the NCP and EPA guidance. The cleanup levels described in the decision documents should be based on risk or ARARs, not dose recommendations, consistent with the NCP and program guidance.

6. The risk summary presented in the package did not present a clear discussion of site risks; and as a consequence, it was difficult for the Board to understand the receptors, exposure scenarios, and estimated risks. Consistent with EPA guidance on the evaluation of baseline risks (Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (EPA/540/1-89/002, December 1989)) and development of records of decision (A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents (OSWER 9200.1-23P, July 1999)), the decision documents should more clearly describe the potentially exposed populations, how exposures can occur, and what estimated risks are associated with these exposures.

7. Under CERCLA, selected remedies must meet ARARs, unless waived, and other "to be considered" guidance (TBCs) can be used in the development of these remedies. The Board recommends that the ARAR tables (Tables 8, 9, and 10 in the package) be further refined. ARARs and TBCs should be clearly differentiated from each other; requirements and recommendations that do not actually pertain to remedial alternatives should be eliminated; and the ARARs/TBCs that are retained should be described in sufficient detail to make clear how the requirement affects the alternatives being evaluated. For example, the ARARs table lists DOE orders (even though the description indicates that they are actually TBCs). Dose recommendations (i.e. 500,100, and 4 mrem/year) in DOE Order 5400.5 are listed in the ARARs table; the Board notes that this is inconsistent with OSWER directives, including Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination, (OSWER Directive 9200.4-18, August 1997) and Radiation Risk Assessment at CERCLA Sites (OSWER Directive 9200.4031P, December 1999). The maximum contaminant level (MCL of 4 mrem/yr to the whole body and any critical organ) should generally be cited as ARARs rather than dose recommendation of 4 mrem/yr effective equivalent in DOE Order 5400.5. The decision documents should explain what particular recommendations from DOE Orders may be appropriate as TBCs at this particular site. In addition, the RCRA location standards applicable to new TSD facilities are identified as ARARs, even though no new RCRA TSD is proposed as part of the remedy. The RCRA closure and post-closure standards, on the other hand, appear to be ARARs that could have a significant impact on the remedy; these requirements should be identified with more specificity as to how they may relate to the cleanup at this site. Finally, the Board notes that Executive Orders are not ARARs, but regulations that implement them may be.

8. The alternatives in the package presented to the Board included a variety of approaches for waste compaction prior to cap construction, especially for Pad A. Based on the package and the information presented to the Board, it appears that sufficient information on the advantages and disadvantages of each approach, including short-term and long-term effectiveness and safety, is not currently available. The Board recommends that the selected remedy include a pilot study of compaction methods to ensure that the best approach for this site is implemented.

9. The preferred alternative includes among other items, removal of source material, capping, and continued operation of the existing soil vapor extraction system to address VOCs in the subsurface and limit VOC migration to ground water. The Region's presentation to the Board indicated that an extensive subsurface monitoring system using innovative techniques is present within and adjacent to the SDA. Given the complex hydrogeologic setting at the SDA and the uncertainties in model predictions, monitoring VOC concentrations and trends will likely be important for determining the success of the remedial actions. The decision documents should provide information regarding the plan to monitor the impact of remedial actions on VOC concentrations in the vadose zone and the adequacy of the subsurface monitoring system to evaluate these impacts.

10. The preferred alternative includes an evapo-transpiration (ET) cap to prevent infiltration and subsequent migration of contaminants. Typically, a key factor in the design of an ET cap is the amount of rainfall and its distribution throughout the year. The ET cap would be designed for what is now an arid environment with 8" annual average precipitation. However, given the nature and long life of contaminants at this site (radioactivity for thousands of years), meteorological conditions could change over the lifetime of this remedy. A substantial increase in average annual precipitation could make the ET cap ineffective. This type of climate change could also impact hydrologic conditions at the site, because the area proposed for capping is currently in the floodplain of a dry wash and protected against occasional flash floods by berms. The Board recommends that the decision documents discuss the potential impact of climate change on the effectiveness of an ET cap and what mechanisms might be used to assess continued effectiveness of the ET cap in changing climatic conditions, (e.g, to protect the cap from the effects of flooding in the long-term).

The Board appreciates the Region's efforts in working together with the potentially responsible parties, state, and community groups at this site. We request that a draft response to these findings be included with the draft Proposed Plan when it is forwarded to your OSRTI Regional Support Branch for review. The Regional Support Branch will work with both me and your staff to resolve any remaining issues prior to your release of the Proposed Plan. Once your response is final and made part of the site's Administrative Record, then a copy of this letter and your response will be posted on the Board website (http://www.epa.gov/superfund/programs/nrrb/).

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 603-8763 should you have any questions.

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